

IN THE CLAIMS:

1. A spatial light modulator system comprising:

a high fill factor MEMS array of tilting mirrors used to attenuate a plurality of wavelength channels in an optical network; and

an interface control circuit controlling said array of tilting mirrors said interface circuit capable of receiving and storing control signals.
2. The modulator system of Claim 1 wherein said control circuit and said array of mirrors are fabricated on the same monolithic substrate.
3. The modulator system of Claim 1 wherein said control circuit and said array of mirrors are not fabricated on the same monolithic substrate.
4. The modulator system of Claim 1 wherein said control signals further comprise definitions for the extent of each of said plurality of wavelength channels.
5. The modulator system of Claim 1 wherein the control signals further comprise a desired attenuation within each of said plurality of wavelength channels.
6. The modulator system of Claim 1 wherein said MEMS array is linear.
7. The modulator system of Claim 1 wherein said high fill factor is greater than or equal to 90%.

8. The modulator system of Claim 1 wherein each mirror in said MEMS array of tilting mirrors further comprises a single tilting cantilever supported by two flexures.
9. The modulator system of Claim 8 wherein each mirror has at least one actuation electrode.
10. The modulator system of Claim 1 wherein each mirror in said MEMS array of tilting mirrors further comprises a single tilting cantilever with an asymmetric flexure resulting in 2-axis rotation.
11. The modulator system of Claim 10 wherein each mirror has at least one actuation electrode.
12. The modulator system of Claim 1 wherein each mirror in said MEMS array of tilting mirrors is supported by side support flexures whose rotational axis is offset from the center of gravity of the mirror.
13. The modulator system of Claims 12 wherein each mirror further comprises means for providing strain relief.
14. The modulator system of Claim 1 wherein each mirror in said MEMS array of tilting mirrors is supported by symmetrically located flexures whose rotational axis passes through the center of gravity of the mirror.
15. The modulator system of Claims 14 wherein each mirror further comprises means for providing strain relief.

16. The modulator system of Claim 1 wherein each mirror has at least one landing electrode having a same potential as said mirror.
17. The modulator system of Claim 1 wherein each mirror in said MEMS array of tilting mirrors further comprises means for maintaining mirror flatness.
18. The modulator system of Claim 17 where in said means for maintaining mirror flatness further comprises at least one stiffener rib located above or below the mirror plane.
19. The modulator system of Claim 1 wherein each of said MEMS mirrors is fabricated of a polysilicon or metal layer.
20. The modulator system of Claim 19 wherein said mirror layer is polished flat using a CMP (Chemical Mechanical Planarization) technique.